

REMARKS

Initially, the Applicant's representative would like to thank the Examiner for the courtesies extended during the telephonic interview conducted on June 22, 2004. During the interview differences between the present invention and the prior art were discussed as well as suggested general language that would more clearly define the claimed invention over the prior art. As discussed in more detail below, Applicant has amended the claims, accordingly, to define over the asserted prior art.

Upon entry of this Amendment, claims 1-5 and 7-12 are all the claims pending in the application. Claim 6 has been canceled and claims 7-12 have been added. Claims 1-5 presently stand rejected.

Claims 1-5 are rejected under 35 U.S.C. § 112, second paragraph.

Claims 1, 2 and 5 are further rejected under 35 U.S.C. § 102(b) as being anticipated by Hosomi et al. (USP 5,820,068).

Claims 3 and 4 are further rejected under 35 U.S.C. § 103(a) as being unpatentable over Hosomi et al. (USP 5,820,068) in view of Sato (USP 6,502,784).

For the reasons set forth below, Applicant respectfully traverses the rejections and requests favorable disposition of the application.

Argument

§112 Rejection

Claim 1 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out the invention. The Examiner asserts that it is unclear what is being compared in regard to the first detector disposed closer to the first guide portion. In

response, Applicant has amended claim 1. Applicant submits that claim 1 satisfies the requirements of 35 U.S.C. § 112.

Prior Art Rejection

In regard to the prior art rejection, the present invention relates to a printer capable of detecting the paper near end, e.g., detecting when the residual quantity of a roll of paper is less than a predetermined amount, with a single sensor, by disposing independent detectors at a position making the detectors workable when the printer is placed either vertically or horizontally, respectively. In particular, in accordance with one embodiment, the first detector detects when the amount of paper is below a certain amount when the printer is oriented horizontally and the second detector detects when the amount of paper is below a certain amount when the printer is oriented vertically.

Claims 1, 2 and 5 are again rejected under 35 U.S.C. §102 (b) as being anticipated by Hosomi, and claims 3 and 4 under §103(a) as being obvious over Hosomi in view of Sato.

Hosomi relates to a printer capable of disposing a near end sensor and a detection lever rotatably at a plurality of positions according to an installation state of the printer. The detection lever is provided with a detector and a protruding portion protruding toward a roll of paper. The detector is disposed in the vicinities of guide portions while rotating on a locus as a roll diameter of the recording paper becomes smaller. (see Fig. 3)

Sato relates to a paper roll remaining amount detecting unit which can adjust a position of a near end sensor by using a notch mechanism. The invention of Sato can operate plural kinds of paper rolls having different inner diameters.

The Examiner asserts that the detectors disclosed in Hosomi are disposed in “an area defined by three surfaces,” although this cannot be clearly read from the specification of Hosomi.

In any event, the claimed invention is different from Hosomi at least because the two claimed detectors respectively are as follows:

The first detector engages, or contacts, the end of the paper roll when the printer is oriented in the first installation state, e.g., horizontally, and the roll of paper is in the first guide portion, while the second detector is disengaged, or does not contact, the roll of paper. Further, the second detector engages, or contacts, the end of the paper roll when the printer is oriented in the second installation state, e.g., vertically, and the roll of paper is in the second guide portion, while the first detector is disengaged, or does not contact, the roll of paper.

Contrary to the Examiner's analogy between the embodiment shown in FIG. 5 of the application and the embodiment of Hosomi shown at FIGs. 11(a-b), Applicant submits that these two structures are clearly different. In particular, the structure shown in FIGs. 11(a-b) of Hosomi clearly shows both of the two alleged detectors, 64 and 65, being used together to detect the amount of paper remaining on the same, single, roll of paper, S. In comparison, detectors, 33A and 33B (e.g., FIGs. 1 and 5), of the present application respectively detect when the amount of residual paper gets below a certain amount depending on whether the paper is in the first guide portion 15A (i.e., horizontal orientation) or whether the paper is in the second guide portion 15B (i.e., vertical orientation).

The different structures and functions of the claimed detectors 33A and 33B and the Hosomi detectors 64 and 65, become more clear when it is realized that in FIG. 5 of the present application, detectors 33A and 33B are offset from each other in a plane parallel to the paper. That is, as shown in FIG. 1, for example, detector 33B is offset to the right from detector 33A. This is because detector 33B detects the paper amount when the paper is in the guide portion

15B, which is to the right, in FIG. 1, of guide portion 15A. Similarly, in FIG. 5 detector 33B is actually offset (e.g., out of the paper) relative to detector 33A. Thus, in FIG. 5, detector 33B contacts paper S when the paper is in guide portion 15B (FIG. 1) and detector 33A contacts paper S when the paper is in guide portion 15A.

By having the above configuration, the respective detectors corresponding to each of the guide portions detect that a paper remaining amount is low without moving the detectors in either of the two installment states (orientation positions) of the printer. Further, the operations of detectors are sensed by a single sensor.

On the other hand, both of the two detectors disclosed in Hosomi are provided so as to detect the paper to be retained into one of the guide portions. That is, one of two detectors detects a space in a core portion of the paper, and the other one detects the end face of the paper to be retained into the guide portion. Therefore, the configuration disclosed in Hosomi requires movement of the switch and the detectors when detecting paper to be retained into the other of guide portions.

The present invention, by having the above configuration, can have an advantage in cost compared to the reference as operations of two detectors can be sensed by using a single sensor. The present invention also has an advantage over that of Hosomi in allowing a user's handling of moving the detectors according to the installment states to be omitted.

For at least the above reasons, Applicant submits that independent claim 1 patentably distinguishes from Hosomi, either alone or in combination with Sato, and, thus, the rejection of claim 1 and all claims dependent thereon, specifically, claims 2-5, should be withdrawn.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 10/067,935

Patentability of New Claims

For additional claim coverage merited by the scope of the invention, Applicant has added new claims 7-12. Applicant submits that the prior art does not disclose, teach, or otherwise suggest the combination of features contained therein. For example, for similar reasons to those discussed above in regard to claim 1, none of the prior art references teach or otherwise suggest the claimed first and second detectors.

Conclusion

In view of the foregoing remarks, the application is believed to be in form for immediate allowance with claims 1-5, and such action is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to **contact the undersigned** at the telephone number listed below.

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